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ABSTRACT

Seven simulation games were played and evaluated by twenty-six graduate students as part of a course in simulation/gaming. Each student also completed the Myers-Briggs Type Indicator, a personality type inventory which assigns each person to one of 16 types based on their placement on each of four dichotomous dimensions. The students' evaluation of the games was then related to their personality type. Differences in game evaluation were found to be related to only the Thinking-Feeling dimension. Thinking types preferred to make decisions based on data and logic while Feeling types tended to trust their emotions. In general, Feeling types rated their personal reactions to the games more positively than did the Thinking types, with the differences significant on three games and in the same direction on the remaining four. In addition, a high percentage of Feeling types indicated they would like to play all games again. There were no consistent differences in the two groups' perceptions of the group functioning in the games or in whether the students would use the game in a class they might teach. (The results were discussed in terms of the distribution of Thinking-Feeling types in certain professions. Evaluation questions are appended). (Author/RD)

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RESEARCH REPORT (1977-78)

Personality Characteristics and Game Evaluation

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ABSTRACT

PERSONALITY CHARACTERISTICS AND GAME EVALUATION

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Seven simulations/games (Starpower, They Shoot Marbles..., BALDICER, C.L.U.G., Tex-G, End of the Line and Job Crunch) were played and evaluated by twenty-six graduate students at North Carolina State University as part of a course in simulation/gaming. Each student also completed the Myers-Briggs Type Indicator, a personality type inventory which assigns each person to one of 16 types based on their placement on each of four dichotomous dimensions. The students' evaluation of the games was then related to their personality type. Differences in game evaluation were found to be related to only one dimension-the Thinking-Feeling dimension. Thinking types prefer to make decisions based on data and logic while Feeling types tend to trust their emotions. In general, Feeling types rated their personal reactions to the games more positively than did the Thinking types, with the differences significant on three games and in the same direction on the remaining four. In addition, a high percentage of Feeling types indicated they would like to play all games again. There were no consistent differences in the two groups' perception of the group functioning in the games or in whether the student's would use the game in a class they might teach in the future. The results are related to the distribution of Thinking-Feeling types in certain professions and implications for selection of games for various groups are discussed.

PERSONALITY CHARACTERISTICS AND GAME EVALUATION

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Evaluation applied to instructional strategies has, in general, been global in nature, aimed at assessing the efficacy of the strategy in the classroom. The response of an individual student to a particular strategy was of secondary interest. Recently, however, interest in the interaction of individual cognitive styles with instructional strategies has increased. In 1976, Samuel Messick and his associates published a review of the research and theory relating individual cognitive styles to learning. In the preface, Messick indicated that:

> ....What is only now beginning to be recognized, however, is that differences in style of learning and thinking also require the attention of educators and researchers. Concern about differences in prior learning and achievement and in level of social and cognitive development is not enough. We must move beyond these differences in context and level of learning to more subtle differences in the processes of cognition and relative thinking to find effective bases for individualizing education. (Messick & associates, 1976,pvi).

Recently, Snow (1977) analyzed the impact an increased emphasis on individual differences in the learner might have on general instructional theory. He concluded that localized theories relating to subgroups of students and to specific subject matter were possible but that a global theory of instruction would not be effective. Thus interest appears to be shifting from the instructional strategy to the interaction between the individual student and the strategy.

The evaluation strategies applied to simulation/games have evolved in the same pattern. Early evaluations were concerned with the efficacy of "serious" games as alternative instructional strategies. Such questions as "Do students learn more [factual material] through playing games? Do games change student's attitudes? What are students "really" learning when they play games?" were the focus of the evaluation. And more often than not the results were applied to simulation games in the aggregate (Boocock & Schild, 1968). As at least some of these questions were answered, both game users and game developers began to focus on the evaluation of particular games. How does an instructor select a game for a particluar class? Why does one game work well while another is useless? What should the developers include in a game? These types of evaluation are a regular part of every issue of Simulation & Gaming and Simulation/Gaming. Obviously such evaluations are and will remain essential to both the game developers and the game users.

Both of these strategies focus on the game: the effectiveness the usefulness, the scope of an individual game or of games in general. Individual differences among participants are treated as error variance in the analysis of the results. That some participants learn from a game while others do not was considered to be a function of the exercise itself. The "better" the game the "better" the evaluation outcome. This model of game evaluation is, of course, both valid and useful.

Recently, however, interest in the reaction of the individual participant has been growing. At the 15th Annual Conference of NASAGA in 1976, five papers related to this area were presented. Three specifically investigated the relationship of personality variables to some aspect of game participation. Schneier (1976) found that "individual performance" satisfaction scores could be predicted surprisingly well from knowledge of personality and interpersonal style of participants. Smith and Weller (1976) found that persons categorized as having internal locus of control perceived a gaming situation differently than did persons classified as being under external locus of control. Both of these studies related personality characteristics of individual participants to their activities in a particular simulation/game or to their perception of that simulation/game. Preston, Hudson and Thios (1976) classified students as to whether they felt they learned well from simulation and found that those who liked simulations preferred the empathetic stylistic dimension of the Cognitive Style Mapping Interest Inventory, a dimension which emphasizes seeing things from another's point of view.

The value of being able to predict those students who will learn well and enjoy simulation-type exercises in the classroom and those who will not would be of great importance to the instructional strategies of any teacher. These studies indicate that further research into the relationship of personality characteristics would be both useful and fruitful.

The present study was basically exploratory. The purpose was to determine: (1) which, if any, of the four dimensions of The Myers-Briggs [Personality] Type Indicator are related to participant evaluation of games; and (2) whether the participants with different personality types react differentially to different games or simulations.

The Myers-Briggs Type Indicator

The Myers-Briggs Type Indicator is based on Jung's theory of types. The instrument classifies people based on the way they prefer to use perception or judgment. The classificiation scheme is based on preferences on four dimensions or scales.

1. Extraversion - Introversion (EI) - Whether to direct perception outward toward the environment or toward the inner world of ideas.

2. Sensing or Intuition (SN) - Whether the person perceives things directly through one or a combination of the five senses (Sensory) or whether he tends to add ideas or associations to the incoming information (Intuitive).

3. Thinking or Feeling (TF) - Whether the person prefers to make judgments (or decisions) based on an impersonal or true-false basis (Thinking) or based on personal values (Feeling).

4. Judging-Perceiving (JP) - "Reflects whether the person relies primarily upon a judging process (Thinking or Feeling) or upon a perceptive process (Sensing or Intuition) in his dealings with the outer world" (Myers, 1973).

Each scale or dimension is dichotomous, i.e. a person is either extrovert or introvert; prefers either the sensing or intuitive mode of perception. Also, it should be noted that these dimensions indicate a characteristic mode of behavior. Any person will act in a manner appropriate to the preference opposite to her/his own from time to time.

A preliminary analysis indicated that Thinking-Feeling was the only dimension consistently related to participants' evaluation of the games. Therefore, all results will relate to that dimension.

The Simulation/Games

Seven simulation/games or simulations were used.

1. STARPOWER - an interactive simulation/game with the use and misuse of power as the primary theme.

2. They Shoot Marbles Don't They - a simulation/game with the relation of resources to power as the theme.

3. BALDICER - a game simulating the world hunger crises.

4. C.L.U.G. - a city planning simulation/game.

5. Tex-G - a business simulation

6. End of the Line - a simulation/game based on the problems of the elderly.

7. Job Crunch - a game simulating the problems of women in the job market.

With the exception of Tex-G which was an on-going exercise lasting several weeks, and C.L.U.G. which lasted two class periods, each game was played and evaluated during a four-hour weekly class period.

Procedure and Evaluation

The entire study was conducted during the weekly sessions of a graduate class in simulation/games offered at North Carolina State University in the Spring of 1976. Twenty-six students were enrolled in the class. The class met weekly for a four-hour period on Monday evenings.

The Myers-Briggs scale was given to the class during the first class period. Students were asked to complete the scale, but were given the option of placing some identification number rather than their names on the answer sheet. Results were given to the class at the last class meeting.

At the end of each class period (or when the exercise was completed in the case of C.L.U.G. and Tex-G), the students were asked to evaluate the exercise and to mark their sheets with their names or the identification number they used on the Myers-Briggs answer sheet. The evaluation instrument is a slight modification of the general evaluation for simulation/games suggested by Duke and Greenblat (1975). The evaluation consisted of 19 objective-type items relating to the individual's role in the game, the type of leadership that evolved, overall quality of group activity, personal reactions to the game, whether the students would like to play the game again, and whether the student would use the game. The responses to the six items evaluating the quality of group interaction and the eight items evaluating the participant's personal participation were averaged to form two additional variables (See Appendix).

Results

The relationship of all variables to each of the four dimensions were analyzed in a preliminary analysis of the data (See Pratt & Little, 1977). However, the only personality dimension that seemed to be consistently related to participant evaluation of the games was the Thinking-Feeling dimension. Five variables were chosen as dependent measures.

1. The average response to six questions relating to the participant's perception of the group functioning (See Appendix, Item 6).

2. The average response to eight questions relating to the participant's perception of his personal participation in the game (See Appendix, Item 7).

3. A single item asking for an overall rating of the game on a scale of 1-5 with five being "very good" or "excellent". (Appendix, Item 8) (OVERALL)

4. A single item: Would you like to play this game/simulation again? _____Yes _____No? (USE)

5. A single item: Would you use this game/simulation if you were teaching a course in which it would be appropriate? _____Yes _____No. (PLAY AGAIN)

A repeated measures analysis of variance across games was impractical because of fluctuations in the number of students rating each game. Therefore separate analyses of variance were performed to assess the difference in ratings given each game by the Thinking and Feeling groups. The average evaluation of group functioning and the student's average evaluation of his/her personal participation in the game were the dependent variables. (See Tables I and II for summaries of the analyses).

There were significant differences between the Thinking and the Feeling groups on three games when personal participation was the dependent variable, but on only one game when the perception of group functioning was the dependent variable. In addition, the direction of the responses was consistent on the personal participation variable. In all games, the Feeling group indicated that they experienced a higher level of personal participation than did the Thinking group, even on games in which the difference was not significant.

In contrast, the differences in the mean ratings fluctuated on the group functioning variable with the mean ratings identical on two games. (See Table I.) Thus it would appear that the two groups had very similar perceptions of the group interaction but that their own personal reaction to the experience was different. The Feeling group, a group that prefers to trust emotions in making decisions had a more positive reaction to the gaming experience.

The data for the remaining dependent variables were not suitable for analysis by parametric procedures. Chi Square analysis seemed most appropriate but because the total number of cases was small Fisher's Exact Test was used to analyze the data for the "USE" and "PLAY AGAIN" variables. There were no significant differences in the positive and negative choices when asked whether they would use the games in a class they were teaching. In fact, <u>all</u> students indicated they would use three of the seven games if appropriate. When evaluating both BALDICER and STARPOWER, the differences between the ratings of the Thinking and the Feeling groups were significant ($p < .025$ and $p < .05$ respectively) with more Feeling than Thinking students saying they would like to play the games again. The results were in the same direction for the other five games, though the differences were not significant. (See Table III for the crosstabulation tables for both USE and PLAYAGAIN).

TABLE I

Summaries of ANOVA's by Game with Thinking vs. Feeling as the Independent Variable and the Student's Perception of the Group Functioning as the Dependent Variable

Game	Group	Mean*	Source	SS	MS	df	F	Sig.
STARPOWER	Thinking	2.43						
	Feeling	2.34	Model	.0259	.0259	1	.15	.71
			Error	3.561	.179	20		
MARBLES	Thinking	1.95						
	Feeling	1.95	Model	.00002	.00002	1	.00	--
			Error	3.996	.266	15		
BALDICER	Thinking	2.54						
	Feeling	2.65	Model	.059	.059	1	.36	.56
			Error	2.95	.164	18		
C.L.U.G.	Thinking	2.31						
	Feeling	2.62	Model	.52	.520	1	5.18	.046
			Error	1.00	.100	10		
TEX-G	Thinking	2.32						
	Feeling	2.41	Model	.026	.026	1	.09	.77
			Error	3.876	.298	13		
END OF THE LINE	Thinking	2.43						
	Feeling	2.43	Model	.0187	.0187	1	.13	.73
			Error	1.152	.144	8		
JOB CRUNCH	Thinking	2.50						
	Feeling	2.26	Model	.00059	.00059	1	.00	--
			Error	1.726	.1726	10		

*The means represent the mean of students' responses to the six questions concerning the functioning of the group during the game. Thus the score for each student was the mean of his/her responses to six questions. A score of one was a negative response, 3 the most positive.

TABLE II

Summaries of the ANOVA's by Game with Thinking vs. Feeling as the Independent Variable and the Student's Personal Ratings as the Dependent Variable

Game	Group	Mean*	Source	SS	MS	df	F	Sig.
STARPOWER	Thinking	1.91						
	Feeling	2.45	Model	1.728	1.718	1	8.04	.01
			Error	4.275	.214	20		
MARBLES	Thinking	1.95						
	Feeling	2.39	Model	.901	.901	1	6.25	.024
			Error	2.162	.144	15		
BALDICER	Thinking	1.98						
	Feeling	2.28	Model	.369	.369	1	1.96	.178
			Error	3.389	.188	18		
C.L.U.G.	Thinking	2.24						
	Feeling	2.52	Model	.463	.463	1	7.24	.023
			Error	.639	.064	10		
TEX-G	Thinking	1.91						
	Feeling	2.14	Model	.258	.258	1	.71	.414
			Error	4.71	.362	13		
END OF THE LINE	Thinking	1.94						
	Feeling	2.19	Model	.079	.079	1	.58	.47
			Error	1.102	.138	8		
JOB CRUNCH	Thinking	2.23						
	Feeling	2.32	Model	.059	.059	1	.52	.486
			Error	1.138	.113	10		

*Six means represent the mean of the students' responses to the eight questions concerning personal reactions to the game. The score for each student was the mean of his/her responses to eight questions. A score of one is the most negative response possible while a score of three is the most positive response.

TABLE III

Crosstabulation of Thinking and Feeling by response to "USE" and "PLAY AGAIN" Questions

Game		Play Again? Yes	Play Again? No		Use? Yes	Use? No
STARPOWER	T	4 36%	7 64%	T	7 70%	3 30%
	F	11 79%	3 21%	F	15 100%	0
		Fisher's Exact Test, $p \leq .05$				
MARBLES	T	4 44%	5 56%	T	7 78%	2 22%
	F	6 54%	5 46%	F	8 73%	3 27%
BALDICER	T	2 22%	7 78%	T	5 56%	4 44%
	F	10 83%	2 17%	F	10 83%	2 17%
		Fisher's Exact Test, $p < .025$				
C.L.U.G.	T	3 50%	3 50%	T	6 100%	0
	F	8 100%	0	F	7 100%	0
TEX-G	T	5 71%	2 29%	T	7 100%	0
	F	7 78%	2 22%	F	9 100%	0
END OF THE LINE	T	2 29%	5 71%	T	7 100%	0
	F	5 71%	2 29%	F	7 100%	0
JOB CRUNCH	T	4 57%	3 43%	T	6 100%	0
	F	7 70%	3 30%	F	8 89%	1 11%

Since the N's were relatively small for the OVERALL variable on all games, the top two and the bottom two categories were combined yielding a 2x3 table (Thinking vs. Feeling by (1) Very Good + Good; (2) Fair, (3) Poor + Terrible). A chi square analysis employing Yates correction for continuity was applied to the table for each game. The seven chi squares were not significant, though the chi square of 5.12 (2 df) for BALDICER did approach significance.

Discussion and Conclusion

These data generally support the findings of Smith and Weller (1976) and Preston, Hudson, and Thios (1976), indicating that individuals with different personality characteristics do react differently to simulation/games in general. Specifically in this study, students classified as Feeling types consistently rated the quality and value of their personal involvement higher than did the Thinking types. The answer to the first research question is clear. One dimension of the Myers-Briggs Type Indicator does appear to be consistently related to participant evaluation of simulation/games. This finding may be of particular importance when an instructor is deciding whether or not a game should be introduced as part of a course or workshop. When students in various fields were tested at the University of Florida in 1972, large percentages of majors in health related professions, the social sciences and liberal arts tended to be Feeling types while students with such majors as building construction, engineering, business and the medical sciences tended to be Thinking types (Hale, 1973). Other data related to type and occupational choice is found in Myers (1962).

The answer to the second research question is not clear. While there were some differences that may have been game-specific, no clear pattern emerged. In particular, the Thinking and Feeling groups tended to be significantly different on more dependent measures on STARPOWER and BALDICER than on other games. Future research in this area might profit from a pre-rating of the degree of emotional involvement required from the participants in the games to be used.

In summary, this study like previous research, indicates that persons with different personality types evaluate their experiences in simulation/games differently. Further research may well lead to predictive criteria for both individual participants and in-tact groups.

APPENDIX

GAMING/SIMULATION EVALUATION

Name (or ID#) _____ Date _____

Name of simulation/game _____

Group (if more than one session run simultaneously): _____

1. What was your individual or group identitiy in the game? (e.g., city politician, "circle," "green")

2. If your role changed during the session, please give later roles played:

3. If there were formal leaders in your group, please indicate the position you had by circling the appropriate number:

   1 leader
   2 participant
   0 not applicable

4. If there were no formal leaders, please indicate how you would describe your participation in the decision-making process. Would you say you were (circle your answer):

   1 a "leader"
   2 an active participant (i.e., vocal in expressing your ideas)
   3 a passive participant (i.e., followed the deliberations but contributed little)
   4 physically present but uninvolved
   0 not applicable

5. Regardless of your role, do you feel you acted primarily as:

   1 an active problem solver
   2 an observer
   3 bookkeeper (keeping track of details)
   4 strategist
   0 not applicable

6. Please describe your group in terms of each of the dimensions listed. These are obviously subjective evaluations, so yours may differ from that of other members. In each case 1 = low, 2 = medium, and 3 = high. Circle your answer.

	Low	Medium	High	Inapplicable
a. degree of activity of group	1	2	3	0
b. broad participation by group members (e.g., everyone participating)	1	2	3	0
c. group cohesion	1	2	3	0
d. degree of cooperation	1	2	3	0
e. ability to reach concensus despite disagreements	1	2	3	0
f. quality of leadership exercised by formal or informal leaders	1	2	3	0

7. Please describe each of the following dimensions of your personal partipation by using the scale below. Again, 1 = low, 2 = medium, and 3 = high.

	Low	Medium	High	Inapplicable
a. interested in the session(s)	1	2	3	0
b. enjoyment of the session(s)	1	2	3	0
c. learning about the system or topic simulated	1	2	3	0
d. development of empathy for those who play your role in real life (i.e., understanding of their problems, tasks, etc.)	1	2	3	0
e. development of empathy for those who in real life play other game roles	1	2	3	0
f. self-awareness, self-understanding	1	2	3	0
g. interaction with others in class	1	2	3	0
h. involvement with mechanics of the game (written) materials, computer terminal or printout, board, chip, etc.)	1	2	3	0

8. How would you rate the simulation in general as a learning/communication experience? Would you rate it:

1 Very good or excellent
2 Good
3 Fair
4 Poor
5 Terrible

9. Would you like to play this game/simulation again?

___ YES ___ NO

Comments:

10. Would you use this game/simulation if you were teaching a course in which it would be appropriate?

___ YES ___ NO

Comments:

11. What did you find the most valuable about this experience?

12. What did you find the least valuable about participating?

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